

Notice of Allowability

Application No.

10/767,598

Examiner

Matthew J. Daniels

Applicant(s)

KROGAGER ET AL.

Art Unit

1791

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the appeal brief received 30 August 2007.
2. ☒ The allowed claim(s) is/are 1,3-5,8 and 10-33.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date Paper No. 20071201.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.
2. Authorization for this examiner's amendment was given in a telephone interview with Leo G. Lenna (42796) on 7 December 2007.
3. Please charge any additional fees required for entry of nine (9) dependent claims to Deposit Account No. 04-1121.

Claim 1: (Currently Amended) A method for filling pores (2) between two adjacent layers (1', 1") of a laminate for a component with high demands upon strength and comprising several layers of fibre composite having within each layer substantially parallel fibers (5) embedded into a matrix (6), in which at least said two adjacent layers have fibre directions differing substantially, which comprises the steps of:

- a) creating slots or fissures (4) propagating substantially in the matrix through each laminate layer along the fibre direction of the layer by cooling said laminate at least in the region (3) of said pore (2) to a sufficiently low temperature such that the matrix material contracts between said fibres to thereby create said slots or fissures (4) along the fibres, through which a material may move inside the laminate between the exterior of the laminate and the pore,
- b) without drilling, applying a flowing, curable material at one outer surface of the laminate and filling the pore through said slots or fissures, and

c) curing the material filling the pore.

Claim 2 was canceled.

In Claim 3, line 1, replaced "claim 2" with -- claim 1 --.

In Claim 4, line 1, replaced "claim 2" with -- claim 1 --.

In Claim 5, line 1, replaced "claim 2" with -- claim 1 --.

Claim 6 was canceled.

Claim 7 was canceled.

Claim 9 was canceled.

Claim 22: (New) A method for filling pores (2) between two adjacent layers (1', 1'') of a laminate for a component with high demands upon strength and comprising several layers of fibre composite having within each layer substantially parallel fibers (5) embedded into a matrix (6), in which at least said two adjacent layers have fibre directions differing substantially, which comprises the steps of:

a) creating slots or fissures (4) propagating substantially in the matrix through each laminate layer along the fibre direction of the layer by exposing the laminate to outer forces in planes transverse to the fibre direction of the layers of the laminate, through which a material may move inside the laminate between the exterior of the laminate and the pore,

b) without drilling, maintaining said outer forces applied in step a) to facilitate transport of the material to the pore (2) and applying the flowing, curable material at one outer surface of the laminate and filling the pore through said slots or fissures, and

- c) after step b), removing said outer forces before curing to automatically press superfluous flowing material out of the slots or fissures, and
- d) curing the material filling the pore.

Claim 23: (New) A method according to claim 22, comprising the additional step of: directly before and/or in connection with step b), heating the laminate at least in the region of said pore (2) to a temperature necessary for making said flowing material thinly fluid.

Claim 24: (New) A method according to claim 22, wherein in step b), outer forces are applied on the laminate in planes transverse to the fibre directions of the different layers to open said thin slots or fissures (4) when applying the flowing material on the outer surface of the laminate for facilitating the transport of the flowing material to said pore (2).

Claim 25: (New) The method according to claim 22, comprising the additional step of, in step b), applying a negative air pressure surface of the laminate on which the flowing material is applied, to facilitate the transport of the flowing material into the laminate through the thin slots or fissures (4).

Claim 26: (New) The method according to claim 22, comprising the additional step of providing a laminate with layers of carbon fibre epoxy.

Claim 27: (New) The method according to claim 22, comprising the additional step of providing a laminate with layers of glass fibre polyester.

Claim 28: (New) The method according to claim 23, wherein said heating is carried out to a temperature exceeding +40°C.

Claim 29: (New) The method according to claim 22, comprising the additional step of providing a laminate in which fibre direction of a respective layer makes an angle of 30 - 90° with fibre direction of adjacent layers.

Claim 30: (New) The method according to claim 22, comprising the additional step of providing a laminate having a thickness of each individual layer between 0.05 and 0.2 mm.

Claim 31: (New) The method according to claim 22, comprising the additional step of providing a laminate composed of 4 -200 superimposed layers.

Claim 32: (New) The method according to claim 22, comprising the additional step of filling, in step b), pores having an area of at least 36 mm².

Claim 33: (New) The method according to claim 22, wherein one or more pores are filled for a component for a flying vehicle or a spacecraft.

Response to Amendment

4. The declaration under 37 CFR 1.132 filed 11 December 2006 in combination with the Examiner's Amendment above is sufficient to overcome the rejection of claim 1 based upon Russell. The declaration states that the thin slots or fissures produced by the claimed method are used instead of the drilling holes of Russell. (Par. 3) The claims are now amended to recite this limitation specifically by excluding drilling from the scope of the invention.

Claim Rejections - 35 USC § 103

5. Rejections set forth previously under this section are withdrawn.

Allowable Subject Matter

6. Claims 1, 3-5, 8, and 10-33 are allowed.

7. The following is an examiner's statement of reasons for allowance: The prior art does not teach or fairly suggest the subject matter of Claims 1 and 22, as amended.

8. The Examiner's amendment above recites new limitations in the independent claim. First, the addition of the limitation "without drilling" helps to distinguish the claimed invention from processes such as those of Russell and Dehm in which drilling is used to reach pores or defects in the laminate. Note the Applicant's declaration filed 11 December 2006 in which Applicant declares that "The thin slots or fissures produced by the claimed method are used instead of the considerably coarser drilling holes of Russell" (12/11/06 Declaration, Par. 3; See also the 5/19/06 Remarks). Russell requires as many as six to eight entry holes to achieve filling of the pore (page 14-4, left col.). It should be noted that Applicant has provided a process in

which the drilling step is omitted while retaining the element's function (creating passages for the flow of resin), and that doing so is an indicia of unobviousness. MPEP 2144.04(II)(B). Reliance on the Wilenski reference is withdrawn as it would not have been obvious to combine the methods in the manner set forth in the previous rejection of Claim 2 while also excluding drilling.

9. In addition, each of the dependent claims recite an additional distinguishing feature. In Claim 1, the particular method of creating the slots is recited. Although Wilenski may teach that permeability of a composite material may increase at low temperatures, Wilenski does not teach a composite repair method or a method for filling pores. Russell's objective is to mend composite damage, and Wilenski provides teaching of causing (additional) damage by exposure to low temperatures (Wilenski, page 115). Therefore, the combination is not suggested by the combination. Because the method of Wilenski provides a detriment, and not an improvement, there would be no rationale for incorporating or substituting it into a composite mending process such as Russell. Claim 22 now recites that the outer forces are maintained during filling of the pore. Where the impact tool of Russell is interpreted to be the "outer forces" creating slots or fissures, there is no reason, teaching, suggestion, or motivation which would lead one to maintain these forces during the filling process, further distinguishing the claimed invention from the prior art.

10. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW J. DANIELS whose telephone number is (571)272-2450. The examiner can normally be reached on Monday - Friday, 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on (571) 272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MJD 12/10/07

MJD

CJ
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